Applying Innovation Inspiration from Nature to Modern Management

Author: Yavnika Khanna

Drucker Challenge 2013

Theme- Innovation Inspiration: Lessons for Innovators from the Arts and Sciences

Welcome to the jungle! Where the weakest gets hunted down by the mightiest and the fastest. Everyone strives for their share of sunshine. Forget growth and proliferation, there is no guarantee of survival. The jungle analogy can be applied to the state of markets where extinction is a real threat and dealing with it is 'business as usual'.

The modern day jungle[i] for organizations is fraught with dynamism, and when rules change, organizations cannot stick to the same game plan, players or battlegrounds. These are times of ever-shortening product life cycles, extreme competition and shifting market spaces. This dynamism has wider practical implications for managers, organizations and nations. The era of rapid turbulence propels the architects of organizations to continuously innovate.

Inspiration is everywhere. Just witness the mighty ant-colonies and the glorious termite- hills or notice the butterflies sipping nectar from the springtime blooms. Or observe the much-dreaded cockroach scrambling about on a pile of unwashed dishes. While the ants and termites present examples of harmonious coexistence and collaboration in the real world, the cockroaches have important survival lessons for adaptation.

Aren't they all management lessons in disguise? What are the prospects of relating nature's ideas to induce and accelerate innovation as embedded culture in organizations? How can managers and organizations unleash the power of innovation, by observing and applying nature's own tried and tested methods? These are the few questions that this essay will attempt to address.

Drucker on Learning from Nature

Drucker ventured far and wide in his thesis. He encouraged the amalgamations of the arts and the science, the qualitative and the quantitative, 'the seen' and 'the felt'. In a 1988 Harvard Business Review article, titled 'The Coming of New Organization'[ii], Drucker looks closely at examples of symphony orchestras, hospitals and British bureaucracy in colonial India, to display models of how traditional, militaristic organizations transformed to adapt to information-based organizations. One can visualize the underlying evolutionary themes in several of his treatises, where he recognizes the perpetual need to change decision processes, management processes and the nature of work in a knowledge society. Not everyone would have found valuable management lessons in these everyday examples!

I find the description of Peter Drucker as a 'social ecologist' the most apt. He used this term to describe management profession which is *"concerned with man's man-made environment the way the natural ecologist studies the biological environment."*

In his first book, *The End of Economic Man*, Drucker treated society as an 'ecology'. He defined it as *"the environment of that very peculiar critter, the human being".* It is natural then, for humans to look out for inspiration from the immediate environment. Drucker clarifies the essential purpose of the organization in this ecology. *"An organization is not like an animal, an end in itself and successful by the mere act of perpetuating the species. An organization is an organ of the society and fulfills itself by the contribution it makes to the outside environment."* Indeed, corporations are now turning attention to concepts of shared value[iii], contemporized by strategists like Michael Porter.

Learning and Applying Nature's Success

"After 3.8 billion years of research and development, failures are fossils, and what surrounds us is the secret to survival. Like the viceroy butterfly imitating the monarch, we humans are imitating the best and brightest organisms in our habitat. We are learning, for instance, how to grow food like a prairie, build ceramics like an abalone, create color like peacock, self- medicate like a chimp, compute like a cell, and run a business like a hickory forest"

- *Bio-mimicry Institute*

Being inspired from nature is definitely not novel, but its conscious application to enhance or imbibe its special capabilities to spurn-off unique and differentiated products, services and management practices is the big idea.

Bio-mimicry has emerged one of the frameworks to apply nature's hard- earned lessons to design product, services, eco-systems and practices. But how can managers mimic the best nature has to offer, apply it to an appropriate business or society? Armed with deeper appreciation of nature, organizations can now hope to replicate nature's feat and envision man- made eco-systems which are interconnected, sensitive, self-enhancing and sustainable.

Innovators been inspired by nature for products, processes and even smart cities[iv]. In an interesting exercise, IBM together with Smart Design, a New York firm, developed a city's water conservation system modeled on a natural ecosystem. The underlying principle is that nature interacts with its creatures through signaling. Say, when water dries up, droughts occur. A green park in this city would, therefore, signal a well-functioning water conservation system.

The innovators devised specialized metering systems that would signal the need for community members to self- regulate resources- a phenomena similar to how animals and birds 'listen and adapt' to nature's signs.

In another initiative to re-imagine the organization to mimic nature's gifts, Ideo partnered with the United States Green Building Council (USGBC). USGBC wanted to be capable of communicating with its 80 local chapters with greater agility and resilience. A hierarchical, top-down communication approach wasn't working for USGBC. The Council wanted to build relationships and form two- way communication channels with its units. Innovators zeroed on to leverage the symbiotic relationships of the shrimps, which eat parasites off of fish by 'signaling' to the fish through their color and posture that they are not there to be eaten, but are available to perform a cleaning service. They developed an intranet where chapters were encouraged to use visual indications to highlight their unique offerings and swarm to form communities, and solicit 'buddies' among themselves[v].

Lesson 1: Simply Surviving or Innovating Simply

"A key to innovation is not to try to be brilliant, but to be simple…. Sow small seeds and make them bear big fruit."

- *Peter F Drucker*

Richard Bookstaber, one of the first to predict the recent global meltdown in the financial markets rightly reveres the cockroaches as a simple yet long- thriving species. The cockroach has survived for 400 million years[vi] in inhospitable conditions. They even have outlived extreme natural disasters such as floods, droughts, and fire. Cockroaches have devised simple tactics to survive sudden turbulence in their environment. Wind might indicate an approaching predator, sprays of pesticides or an occasional flip-flop intercepting their trajectory. Cockroaches have developed a bio-evolutionary wind-evasive response to dive in air which enables them to react within milliseconds towards changing wind patterns. By keeping the algorithm simple, the cockroaches can respond to whatever environment they are in. Bookstaber concludes, "*The coarse response although suboptimal for any one environment, is more than satisfactory for a wide range of unforeseeable ones.*"

Drucker cautioned "*Do not confuse innovation with novelty*"[vii]. He wrote further, "*All effective innovations are breathtakingly simple. Indeed, the greatest praise an innovation can receive is for people to say, "This is obvious. Why didn't I think of it?*[viii]*"* Perhaps, managers need to think of simpler response mechanisms instead of equating innovation only with continuous new product development. Simple strategies can help organizations brave the complex market environment: finding alternatives to make products and services faster and simpler or seeking new markets and consumer segments. In an era of rapid change, organizations must be maneuverable and agile to respond to unexpected shifts in the external environment.

The most striking change of the past two decades is that the global economic power shift. The emerging markets El-Dorado is fueled by advantages such as favorable demographics, leapfrogging technological cycles and a growing 'marketization'. The ideas of frugal innovation[1] are increasingly being used in context of the patterns of innovation borne out of bare necessities, especially in emerging markets[ix]. These innovations solve immediate problems, are plainly built, simply used in unique contexts, and can be commercialized with minimal costs: mimicking the cockroaches, and in line with Drucker's advice.

Lesson 2: Innovation by Harnessing Power of Self- organizing Teams

Drucker recognized that *"Ants and bees are as much social animals as man"*[x]. What can the intellectually superior human race at the apex of the food pyramid, learn from tiny dwellers, which have survived on the planet for more than 100 million years[xi] and have built up strange colonies that spread over kilometers at stretch, and house several million members?[xii]

Individual insects may not boast of extraordinary intelligence but together they achieve brilliant outcomes. They require minimal supervision and their coordination is a result of complex networking which enables them to share information quickly and efficiently. They allocate labor flexibly, yet each member performs specialized tasks. Their social systems seem robust, even when one individual fails, the system continues with minimal breakdown. Peter Miller, in his book *'Smart Swarms*[xiii]*'* extends the analogy and explains how communities of these 'social insects' leverage the collective intelligence of its network members.

Bonabeau and Meyer cite examples of Southwest Airlines, Unilever, McGraw-Hill , HP and Capital One- all organizations which have leveraged on the self- organizing characteristics of these social insects to improve their operations[xiv]. Southwest Airlines used the efficiency practices mastered by ants to improve their freight operations. Through the new leaner operation design, they cut freight transfer rates by 80 per cent at their busiest stations and reduced the workload of their employees by 20%. Unilever applied the principles of shortest routes practiced by ants to forage for food sources. As a result, the company enhanced the efficiency in scheduling of jobs. By creating an algorithm and a software program similar to the ants, to determine the shortest time taken to perform a set of jobs, Unilever could benefit from a leaner approach. In the era of social networks and the digital media, the relevance of swarm intelligence is amplified.

[1] Innovations borne of necessity, using bespoke technologies of their own creation

Organizations like Xerox, Tyco, Capgemini Consulting and Westfield have setup online exchanges like Yammer for their employees. These idea- exchanges make traditional and formal communication structures less relevant and provide every employee like the worker ant access to relevant and real-time information through their peers. Xerox, specifically uses Yammer as a platform to enhance innovation speed within the company.

How will today's organizations harness the true potential of their knowledge workers and enable highly effective teams? Peter Drucker wrote extensively on self-organizing teams. He suggested eliminating hierarchy in organizational structures and easing informational flows in the organization to harness the self-organizing capabilities. In his article, 'The Coming of New Organizations'[xv], he mentions how outmoded corporations have *"whole layers of management – (which) neither make decisions nor lead. Instead, their main, if not the only function is to serve as "relays"- human boosters for the faint, unfocussed signals that pass for communication in the traditional, pre-information organization."*

Bees, ants and termites have all learnt to eliminate unnecessary managerial flab to effectively synchronize individual goals to common 'organizational' objectives. These insects have learnt over time to take group- optimal decisions. Take the example of how honey bees democratically take decisions regarding splitting- up swarms and setting up a new honeycomb. Seeley[xvi] describes the process where forager bees perform the role of scouts for the new location and dance to inform the rest about possible opportunities. The individual members of the swarm then exchange these messages to eventually move to the most preferred site.

Lesson 3. Innovate by Applying the Systems Approach:

Nature also provides the best lessons of 'creative destruction' popularized by Schumpeter. At the heart of his theory of competitive behavior is the assertion of hyper- competition. Competition leads to hyper- competition, only to suck innovation out of the system, leaving behind embers. This erosion of profits due to an overcrowded market was recognized by Drucker when he prophesied that, "*today's profit is tomorrow's white elephant*"[xvii]. Mindless pursuit of profits are often are the basis of self- perpetuated destruction.

In their seminal article, 'Runaway Capitalism [xviii]', Kirby and Meyer cite examples of evolutionary biology where some species like peacocks are prone to commit short term selection errors in choosing their mate. These errors get amplified through genetics to eventually result in their own annihilation. Peahens consider a flamboyant tail as a signal of the health of potential mates. Sadly, peacocks die in droves as their showy tails make them easy prey to the honey badgers.

The authors apply this 'peacock effect' to managers, organizations and even nations to conclude that organizations fail to recognize such self-perpetuated threats. These threats could arise in the way they measure success. Kirby and Meyer opine that Return on Equity (ROE) as a criterion not only dominates investment decisions but the business as a whole, because they are easy to calculate. These continue to be wrongly applied to denote organizational competence. Eventually the over- dependence on ROE encourages political culture, leading to myopic and 'silo-ed' organizations. Change is imminent though. Managers are increasingly being prized based on their performance on multiple criteria. Organizations are beginning to look at the 'triple bottom-line'[2]. This signals a move away from the rigid metrics to those that capture the fluidity and diversity of variables.

Lesson 4. Collaborating to Innovate:

The plant and animal kingdom present examples where each of the members create win- win situations and thrive in mutually conducive ecologies. Flowers provide nectar to butterflies, which in turn help in pollination. This is a common form of *mutualism*, when both species involved benefit from the relationship. Symbiosis is nature's way to create balance and harmony even in an environment where perpetual resource competition (whether food or territory) is a reality. Contrary to the threat of hyper- competition, the strategy of collaboration enhances value for all the stakeholders.

As per the IBM Global CIO Study conducted in 2011, 66% of CIOs of top organizations view collaboration as the key method to drive innovation. Collaboration has become the cornerstone of successful delivering innovative solutions for the customers.

Observe the development and proliferation of collaborative methodologies like Agile[xix], where business people and developers must work together daily throughout the project to deliver software. The Agile working principle revolves around harnessing the power of self-organizing teams to deliver customer service excellence. Another interesting example is the growth of the open source software[3], a challenger to the predatory vendor lock-in strategy of major players in the software industry.

Hesselbien[4] and Austin [xx] see greater scope for collaboration between non- profits, business and government agencies, they suggest a symbiotic form of strategic alliance, which will

[2] The phrase "the triple bottom line" was first coined in 1994 by John Elkington, the founder of a British consultancy called SustainAbility. He suggested the 3 Ps: people, profits and the planet.

[3] The Open Source Initiative (OSI), a non-profit corporation which advocates the development method for software that encourages peer review and transparency of process.

[4] Frances Hesselbien is widely credited for the turnaround of the Girl Scouts USA as its Chief Operating Offer (CEO).

accelerate positive change. The U.S Army, is much like a business in terms of human resource challenges such as recruitment, retention, productivity and mission. Together with the private sector, they designed and executed a program called 'Army's Partnership for Youth Success[xxi]' that provided opportunity for young people to enlist with the U.S. Army, while benefiting from the future possibilities to join a suitable partner company after they serve their nation. Companies are also interested in trained young people with the grooming, work ethic and value system imbued through the U.S Army experience. This partnership seems a very viable symbiotic solution to the war for talent.

Conclusion:

In infinite known and unknown ways, the natural world typifies the need for continuity and innovation. Nature has learnt these lessons through trials and tribulations of several million years. At a time of growing business complexity, managers and leaders can turn to their immediate nature for four essential innovation lessons:

1. Organizations must think of how to innovate simply, rather than focus on simply survival
2. They should find ways to harness the power of self- organizing teams, especially in view of the emergence of the knowledge society, need for decentralization and changing nature of work
3. Innovation cannot be an insulated process only reserved for the designated innovators. Organizations should consider the dynamics and the systems view of the eco-system to drive innovation
4. Collaboration is increasingly becoming the key in the networked and wired world. Organizations must empower employees with tools and techniques that streamline information flows to manage complexity and dynamism

Readings and References

[i] Govindarajan, Vijay and Srinivas, Srikanth , "Finding your Place in the Competitive Jungle", Harvard Business Review Blogs, April 2013, accessed at the URL: http://blogs.hbr.org/cs/2013/04/finding_your_place_in_the_comp.htmll

[ii] Drucker Peter, "The Coming of New Organization", Harvard Business Review, January 1988, accessed at URL : http://home.base.be/vt6195217/neworganization.pdf

[iii] Porter, Michael and Kramer, Mark, "Creating Shared Value", January 2011, Harvard Business Review Blogs, accessed at URL: http://hbr.org/2011/01/the-big-idea-creating-shared-value

[iv] Bio-mimicry Challenge, Fast Company, 2010, accessed at URL: http://www.fastcompany.com/tag/biomimicry-challenge

[v] Walker, Alissa, "Biomimicry Challenge: IDEO Taps Octopi and Flamingos to Reorganize the USGBC**",** May 2010, accessed at URL: http://www.fastcompany.com/1643489/biomimicry-challenge-ideo-taps-octopi-and-flamingos-reorganize-usgbc

[vi] People for Ethical Treatment of Animals, "Cockroaches", accessed at URL: http://www.peta.org/issues/wildlife/cockroaches.aspx

[vii] Lefler, Peter, "The Simplicity of Innovation", Spruance Quarterly, accessed at URL: http://www.spruancegroup.com/spruancequarterly/the-simplicity-of-innovation

[viii] Drucker, Peter, "The Essential Drucker", Harper, 2001, p. 274.

[ix] McNicoll, Arion, "Enter India's amazing world of frugal innovation**"** , CNN technology, June 2013, accessed at URL http://edition.cnn.com/2013/06/25/tech/innovation/frugal-innovation-india-inventors

[x] Wartzman, Rick, "A Bug's Life: What Managers Can Learn From Ants", Forbes, June 2013, http://www.forbes.com/sites/drucker/2013/05/07/managers-can-learn-from-ants/

[xi] University of Texas, "New Ant Species Discovered in the Amazon Likely Represents Oldest Living Lineage of Ants" September 2008, accessed at URL: http://www.utexas.edu/news/2008/09/16/new_ant_species/

[xii] Oregon State University, "Discovery in amber reveals ancient biology of termites", June 2009, accessed at URL: http://oregonstate.edu/ua/ncs/archives/2009/may/discovery-amber-reveals-ancient-biology-termites

[xiii] Miller, Peter, "The Smart Swarm: How to Work Efficiently, Communicate Effectively, and Make Better Decisions Using the Secrets of Flocks, Schools, and Colonies", Avery Trade, July 2011

[xiv] Bonabeau, Eric and Meyer, Christopher, "Swarm Intelligence: A Whole New Way to Think About Business," Harvard Business Review, May 2001.

[xv] Drucker Peter, "The Coming of New Organization", Harvard Business Review, January 1988, accessed at URL : http://home.base.be/vt6195217/neworganization.pdf

[xvi] Seeley, Thomas, "Honeybee Democracy", Princeton University Press, 2010.

[xvii] Drucker Peter, "Schumpeter and Keynes", *Forbes*, May 1983

[xviii] Meyer, Christopher and Kirby, Julia, "Runaway Capitalism" Harvard Business Review, January 2012.

[xix] The Agile Manifesto, accessed at URL: http://agilemanifesto.org/

[xx] Workbook on Managing Collaboration Challenge, 2002, accessed at URL: http://www.hesselbeininstitute.org/tools/collab_challenge/collab_workbook.pdf

[xxi] Innovative Public-Private Partnerships: The United States Army and the Private Sector, accessed at URL http://www.hesselbeininstitute.org/forms/army.pdf

Cover page graphics (peacock feathers) credits: http://www.genovic.com/